THE VETERINARY RECORD

A Weekly Journal for the Profession.

Edited by WILLIAM HUNTING, F.R.C.V.S.

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DISEASES OF ANIMALS ACTS—RETURNS.

The tabulated returns of contagious diseases of animals which we publish every week are rather dry reading, but they are well worth more notice than they get.

Of Anthrax there were 18 outbreaks in the week ending September 2nd. For the corresponding week in the three previous years the outbreaks were respectively 7, 10, and 11. This is a considerable increase, and the outbreaks occurred in widely separated places, as Cornwall and Devon, York and Surrey. Scotland contributed five outbreaks.

Of Glanders there were 30 outbreaks, whilst in the corresponding weeks of the previous three years there were 42, 37, and 24. Last year was the worst of glanders for 14 years, and the decrease is just sufficient for the Board of Agriculture to use as an argument for doing nothing. In this connection we draw attention to another death of a man from glanders—diagnosed in a hospital and by the aid of the bacteriologist. How many cases die in private practice which are never diagnosed? The medical profession are beginning to recognise that deaths from glanders are not represented by the returns of the Registrar-General. Last week we heard an eminent pathologist express the opinion that probably 100 people die from glanders in London every year—and yet the Board of Agriculture do nothing.

Of Sheep-scab only six outbreaks are returned. This shows an increase over the corresponding weeks of the three previous years. No inference can be drawn from this because it is common knowledge that not half the outbreaks were returned in previous years, and probably a large number remain unnotified under the existing Orders.

Of Swine Fever there were only 12 outbreaks returned for the week, which compares well with the corresponding weeks of the three previous years, which showed 26, 14, 13. Although we have heard it said that many cases of swine fever are unreported owing to the adoption of compulsory isolation instead of slaughter with compensation, we really believe there is a sign of progress being made in stamping out this disease. The limited use of slaughter is perhaps excusable from the taxpayer's view, but whenever the Board feel that they have mastered the plague, and that only a few centres of disease are left the best policy to ensure success will be to slaughter and pay, so as to leave no infection to again spread over the country.

If no swine-fever exists save in Chester, Gloucester, Lincoln, Northampton, and York, except previous outbreaks, the embers of which are isolated and watched, one may look forward hopefully to an end of the disease.

ILIAC THROMBOSIS.

On the night of Aug. 22nd I was called to see a bay horse, property of one of our railway companies, and on my way to stables received the following statement of the case. The horse had been resting for two or three days, but on this day had been engaged at light work in the stable yard when he was noticed to be going wrong behind, and was turned in, when he lay down and subsequently on attempting to rise had so much difficulty in doing so that assistance was rendered. He was then blowing badly, sweating, and had so much difficulty in keeping on his feet that the stable foreman placed him in slings. I was not informed of the case until night, because it was not thought that he was seriously amiss.

I found him in the slings—standing on three legs. The other one—the near hind, being crossed over in front of the off hind, no weight could be placed on it, in fact on attempting to move him the leg gave way and down he went into the web of the slings, and had to be assisted to get up again. He was blowing slightly, pulse thready, somewhere about 100, ear tips deathly cold. On passing my hands over both quarters I was at once struck with their coldness, this was especially the case as regards the near quarter, the coldness was continuing down the limb inside and outside to the heel, which was as *cold* and *insensitive* as that of a dead horse. A new symptom to me in such cases was paralysis of the penis, which hung out of the sheath some eight or nine inches.

Examination of the aorta and iliac arteries per rectum was at once decisive of the case. No pulse could be felt except in one branch, certainly a very slight impulse could be felt, but absolutely no pulse, and I at once declared the case to be one of iliac thrombosis.

As everything pointed to the case being likely to be a fatal one, he was let down out of the slings and a man set to watch him. He died in a few hours—very quietly.

The post-mortem examination, made on the following day, showed complete plugging of the external and internal iliacs on the near side, and of the internal on the off side. the thrombus consisting of firmly coagulated blood. A probable cause of the thrombus was a tumour, some three or four inches long, not unlike a good-sized kidney potato, which was in close contact with the aorta and iliacs, underneath them—*i.e.*, with the surface of the tumour towards the pelvis. What this tumour is exactly I do not know, but the right kidney, which was 31 lb. in weight, was apparently simi-

larly affected. Another deposit of same description was in the middle of right lung. I have a portion of the kidney and the whole of the tumour taken from below the aorta, and shall be pleased to forward portions to anyone who would like to examine them. The plugged vessels I have beside me and will be pleased to exhibit.

The feature of the case interesting to me is the fact that we may, as proven by this case, have iliac thrombosis occurring and causing death in less than 24 hours without having shown any of the usual symptoms—paroxysmal lameness and partial paralysis generally associated and symptomatic of such cases. This horse was seven years in the service he died in, and all he ever showed was that he did not back well, and latterly, in the words of the stable foreman, "seemed to be getting frail."

R. Rutherford, F.R.C.V.S.

Edinburgh.

SWINE ERYSIPELAS.

(*Fr.* Rouget du porc. *Ger.* Schweinerothlauf.)

By Henry Gray, M.R.C.V.S.

As this disease has been raging with disastrous results in Cambridgeshire during the past week or so, a few remarks on its nature and treatment may not now be out of place in your valuable journal.

Although it has hitherto very rarely spread rapidly it is nevertheless not a rare disease in this country, and although its mortality is never great in a particular district, still, the isolated cases here and there amount to a very high total during the course of a year for the whole country.

Until bacteriology became an established science in this country there was, very generally, no differentiation between the various infectious diseases of swine—all, including swine-fever, swine-plague (pneumo-enteritis or pasteurellosis) and swine-erysipelas were grouped under the denomination of "swine-fever." Still, however, many practitioners recognised that it was not of the same nature as this latter disease.

It is due to a fine bacillus which is identical to that of mouse septicæmia. The majority of observers say it is a saprophyte, and so far as the mouse is concerned Dr. Koch was able to isolate this organism from the waters of the Panke and induce septicæmia in it. His results have been confirmed by others. Again, many affirm that the pig itself may be in an absolute state of health and yet be the bearer of this microbe in the tonsils or intestine. It is not only pathogenic for the pig and white and grey mouse, but also for the pigeon and rabbit, which may sometimes contract it from the former during an outbreak.

One may naturally ask, If it affect the mouse, is it not possible for this creature to be the source of an epizootic in the pig?

In its rapid or virulent form it resembles an acute septicæmia; but when running a slower course it may ultimately resemble rheumatism with or without vegetations on the valves of the heart, the earlier manifestation of it being frequently overlooked. When it is a mild attack, or the virulence is of a lower degree, it mostly causes in young pigs an eruption of the skin, which is commonly termed "measles" by pigmen, or it may show itself in the form of blotches or wheals—the urticaria of the pig.

Curative Treatment with Anti-Toxic Serum.

As the Board of Agriculture does not give compensation for deaths arising from this disease, would it not be advisable for the members of our profession practising in districts where it abounds to recommend pig-owners to have their pigs vaccinated, or at least treated with the anti-toxic serum, especially that prepared according to the method of Dr. Leclainche, of the Toulouse Veterinary School.

The already contaminated pigs, that is, those that have been exposed to infection, are treated with the pure anti-toxic serum which renders them refractory to the disease in a few hours.

Ten or twenty cubic centigrammes, according to the weight of the pig, are injected by means of an antitoxic syringe.

This is sufficient to tide them over for a fortnight, but it is not lasting and only produces temporary or passive immunity.

Sero-Vaccination.

If it is desirable to render them more proof against the disease an inoculation with a *preventive vaccine* combined with the *antitoxic serum* may be made eight or ten days after the precautionary inoculation with serum. A *second inoculation* can be made after an interval of 12 days, using this time the second or virulent vaccine but no serum.

Those pigs that have not been exposed to the infection may be inoculated at once with the serum and vaccine (sero-vaccination). The second inoculation is performed under similar conditions to those advised for the contaminated pigs,

The operation is made either inside the thighs or behind the ears.

ABSTRACTS FROM FOREIGN JOURNALS.

Coagulating Injections into Synovial Tumours.

MM. Joly and Lasserre, Veterinary Surgeons in the School of Cavalry.

Three horses affected with synovial cysts on the knee were treated by the coagulating injections recommended by Cagny. The liquid injected was composed of the following:—

Alcohol 96°	100 gr.
Antipyrin	10 „
Spirit of tannin	10 „

In every case 2 cubic centimetres of this solution were injected into the synovial sac. After the injection considerable swelling of the region was produced, but this gradually dispersed, and recovery was obtained a few months after the operation. The same authors have had excellent results with this liquid in cases of bursal distensions on the tendons.—(*Rec. d'hygiene et de méd. vét milit, 1905.*)

H. G.

Hygroma of the Poll. Leon Dupas.

An aged mare has on the poll two cystic tumours, of 18 months standing. These are separated by the insertion of the mane. They are elongated; the left measures 12 centimetres in length and is as big as the fist; the right twice as large (measures 25 centimetres. They are painless, hard and prominent when the head is flexed, rather soft and fluctuating when it is extended. They evidently communicate. The diagnosis is easily made out. The treatment was complicated and lasted quite long. First deep needle cauterization was resorted to—thirty points on the right, fifteen on the left. Large escape of fluid followed the operation, and of course reduction of size of the tumours. Two days later they were as large as ever. A s cond cauterization was followed by the same result. Then came in succession free incision of the two lobes at their extremities. This was followed by the exit of about a thousand small riziform masses. Tents were introduced in the incisions of the cysts, to allow antiseptic irrigations. Thus suppuration is established. A hard, warm and painful swelling appeared at the upper end of the left tumour. Lymphatic cords appeared along the neck. The swelling be came fluctuating, and puncture with the cautery gave issue to an abundant collection of pus. Still the tracts of the cystic tumours did not show tendency to close, but assumed the characters of fistulæ, which resisted treatment with oxygenated water, tincture of iodine, nitrate of silver, etc. It was then that in despair the four fistulous tracts were freely cut open and continued irrigation, night and day, was started. With this last attempt recovery was completed in thirteen days. The author regrets that he did not resort to this last treatment first of all, and save the two months during which the mare had been laid up.—(*Rec. de Méd. Vét., Dec. 15, 1904.*)

CANCER.

In Dr. Bashford's introduction to part II. of the Second Report of the Imperial Cancer Research Fund, he says:

"On behalf of the Executive Committee I have to acknowledge indebtedness to the Board of Agriculture for instructing the Veterinary Inspectors of the Board to forward specimens of cancer in animals, and to the following members of the Veterinary profession who have materially assisted us by forwarding valuable specimens:—

Messrs. G. A. Banham, C. H. Beadnell, J. V. Blake, J. Blakeway, A. Bostock, C. T. Bray, Prof. Brodie-Mills, Bombay; D. Brown, Buscombe, J. Coe, F. W. Consens, Duncan Cumming, H. Davies, W. R. Davis, E. L. Dixon, T. Eastwood, Farrell, F. C. Gillard, J. A. Gilruth, New Zealand; T. B. Goodall, H. Gray, H. Hall, R. J. Hickes, C. G. Hill, F. T. G. Hobday, W. H. Brooke, C. Hoole, J. P. Isherwood, Henry Jarvis, R. Jones, G. E. King, Lionel L. Leach, G. D. Martin, Prof. Albert E. Mettam, P. J. Mullane, W. G. Nash, W. Pauer, H. J. Parkin, A. E. Payne, H. J. R. Pope, E. H. Pratt, D. Pugh, C. Roberts, R. Craig Robinson, W. Scott, J. F. Simpson, H. M. Singleton, F. L. Somerset, M. T. Sparrow, D. M. Storrar, H. Karslake Tasker, W. Taylor, R. C. Thompson, A. H. Towne, R. C Trigger, A. M. Trotter, J. E. Wallis, Prof. W. Owen Williams, and W. Willis."

Then follows a chapter of great interest which we reprint below.

Transplantation of Malignant New Growths

In previous papers we confirmed the observations made by Jensen on the processes which lead to the continued growth of tumours in fresh hosts. Our earlier investigations were carried out on mice with an adenocarcinoma of the mamma and with Jensen's tumour, which he regarded as an epithelioma. The conclusion that the tumours developing after t ansplantation of tissues in mice are the direct genealogical descendants of the cells introduced has since been corroborated by other investigators, and is gradually receiving general acceptance. There is, however, still diversity of opinion in interpreting the significance of the process, which is essentially a manifestation of the continuous powers of growth of the cells of the original tumour.

With the exception of ourselves, those who have expressed an opinion based on personal observation have hesitated to assign this continued growth to properties possessed by the actual cells. They assume in one form or another the existence of an extraneous living agent or virus, whose presence in the cells calls forth this unexampled growth as a reaction comparable to that met with in the infective processes accompanied by cell-proliferation. Borrel has sought by careful detailed study of the proliferative processes, in cattle plague, sheep pox (clavelée), molluscum, variola, and syphilis, to establish the possibility of a parallel between the epithelial proliferations in these diseases and those of cancer.

Our attempts to propagate cancer artificially were undertaken as part of a comprehensive scheme for studying the fundamental biological attributes of the disease. It was recognised that if Jensen's conclusions were correct, then artificial propagation afforded the necessary facilities for studying growth at successive stages, but gave no direct information on the mode of origin of cancer nor on any connection which might subsist between sporadic cases. Before, however, we were justified in concentrating our attention on the features of continued growth much preliminary work had to be done on the nature of cancer in animals generally, and on the relative part taken by the different constituents sharing in the formation of the daughter tumours following on transplantation.

We have already discussed the bearing of the distribution of cancer in animals on the problem as it presents itself in man, and although fresh data have accumulated nothing of sufficient importance has been ascertained to justify a further discussion on the subject, beyond the remarks made in Part I., p. 32, on the biological significance of the age incidence of cancer. We shall therefore discuss the bearing of artificial propagation on some features of cancer more particularly than we felt justified in doi g in former papers.

We have endeavoured to propagate all malignant new growths which we have obtained in a living condition and sufficiently free from septic processes during the past two and a half years. These comprise growths from the horse, dog, cat, rat, mouse, and carp. The tumours in the horse have been two cases of squamous-celled carcinoma, one of these with extensive secondary growths, and one melanotic sarcoma also with extensive secondary growths. With these tumours, inoculations were made into horses, all with negative result. In view of the small number of inoculations this result has little value, and the horse is mentioned apart from the other mammals.

Malignant new growths of the dog, cat, and rat have been inoculated into other individuals of the same species. These growths have been various squamous-celled carcinomata, adeno-carcinomata, sarcomata, (round-celled, mixed celled, spindle-celled), osteo-sarcoma, chondro-sarcoma. The results of more than nine hundred inoculations have been entirely negative, as have been attempts to transplant the tissue from those mammary tumours which are common in old bitches and consist of several tissues, frequently containing cartilage and bone associated with glandular structures. In the case of the dog and cat, other tumours have been transplanted which were subsequently found to be really infective granulomata. We shall devote some attention to such a tumour of the dog owing to the fact that in our opinion it is identical with a disease which has been successfully transferred to other animals by several investigators, who have interpreted their experiments as successful transplantation of a sarcoma or carcinoma. We shall show that this is not the case, and that the observations on this disease ought not to be interpreted in this manner.

The tumour of the carp presented a striking resemblance to squamous-celled carcinoma of mammals, and multiple inoculations were made into six carp with completely negative results.

Owing to the positive results obtained by ourselves and others on inoculating mouse tumours into other mice, it is necessary to refer to the malignant new growths of this animal in more detail. As it will become obvious in the course of the succeeding descriptions that several of these tumours possess all the essential characters of malignant new growths in man, it is unnecessary to discuss this question here.

Tumour formations are not uncommon in the mouse. In almost 30,000 tame mice we have found twelve tumours presenting features which justified us in regarding them as malignant new growths. The commonest form occurs apparently in the mammæ, from the axilla to the inguinal region, and attains a large size. While still of small size, the tumour presents a localised spherical enlargement situated asymmetrically in the gland with reference to the nipple. The surrounding mammary tissue is sharply delimited from the growth. The form of the larger tumours is also usually spherical, but is occasionally flattened, especially when situated in the inguinal region. Some are very soft, with much hæmorrhage, others are of firm consistence. Histologically they are always very cellular, and consist of minute acini lined with cubical epithelium, reproducing in varied degree the appearances characteristic of the normal mammary tissue of the mouse or deviating very markedly from them. The adenomatous structure is obscured in places by irregular masses of polygonal cells intervening between the acini, and together with them forming large alveoli of epithelial cells, separated from each other by delicate septa of connective tissue bearing blood-vessels In those of soft consistence large cystic spaces lined with a single layer of cells occur. In the more solid parts of the growth, localised areas of keratinisation are occasionally met with, and at these points the acinous structure is completely lost. It may be noted in passing that the size of the cells varies in different tumours and frequently also in different parts of the same tumour. We have obtained nine tumours of this kind, eight being in old females and one in a male. We kept the animals alive as long as possible, and noted that all these tumours grew rapidly. Whenever there appeared to be danger of ulceration of the growth or of the mouse dying from intercurrent disease, the animal was at once killed and transplantations were made. In none of them were secondary growths met with, they grew expansively and pressed on the surrounding structures rather than infiltrated them, in some cases causing great deformity. The absence of secondary growths may be due partly to the relatively early period at which the animals were killed. The results of transplantation experiments with these tumours will be described below.

We have obtained one case of primary adeno-carcinoma of the intestine. Two distinct growths were present in the small intestine separated by nearly an inch of healthy gut. Their histological characters and mode of growth are illustrated in fig. 40, p. 47, and fig. 41, Plate XVI., from which their identity with primary carcinoma in the human subject is evident.

In another mouse a lobulated tumour was found in the meso-rectum at the brim of the pelvis. The growth obstructed the pelvic inlet and led to great dilatation of the gut in the abdominal cavity. Histologically it consisted of very regular acini indistinguishable from those of normal pancreas, but without islets of Langerhans. Unfortunately no microscopical examination of the pancreas was made in this case.

In addition to these tumours occurring in our own mice, we have exchanged preparations of adeno-carcinomata of the mouse with Dr. Peck and of squamous-celled carcinoma and adeno-carcinoma with metastatic growths with Professor Borrel, and have also exchanged living material with Prof. C. O. Jensen, Dr. Michaelis, and Prof. Borrel. The bearings of the relative frequency of malignant new growths in mice and animals generally are discussed on page 32 of the first part of this report.

Opinions are much divided as to the type of growth to which Prof. Jensen's tumour should be assigned. Jensen himself believed it to be an epithelioma or an adeno-carcinoma, basing his opinion on the general character of the tumour and the site of the primary growth. Prof. von Hansemann has expressed the opinion that it was not in any case a true cancer, but might be an endothelioma. In describing the nine sporadic adeno-carcinomata of the mammary region of the mouse which we have obtained in our own material, we have noted that small areas of keratinisation are occasionally found in tumours whose general acinous structure is easily recognised. We have found that in Jensen's tumour, acini lined by a single layer of cells with intercellular cement-ridges (Schlussleisten) are not uncommon, and we believe that it is in all probability a carcinoma of glandular origin, related to ordinary adeno-carcinomata in much the same way as encephaloid carcinoma of the mamma in the human subject is related to the more distinctly adenomatous types of malignant new growths of that organ. This view harmonises very well with the fact that Jensen's primary, tumour was situated in the subcutaneous tissue and adherent to the skin, and with the frequency of tumours in this site. We shall have occasion to refer to the occurrence of secondary deposits following transplantation of Jensen's tumour, and as Haaland has also described metastases in the pulmonary artery, we need not consider at any greater length the view that it is an endothelioma.

WESTERN COUNTIES VETERINARY MEDICAL ASSOCIATION

A meeting was held at the Bedford Hotel, Tavistock, on Tuesday, 1st August last. The President (Mr. G. H. Gibbings, Tavistock) occupied the chair, and there were also present Messrs. T. Olver, Truro; A. H. Oliver, Devonport; E. J. Thorburn, Okehampton; William Penhale, Holsworthy; R. E. L. Penhale, Torrington; J. Dunstan, Liskeard; P. G. Bond, Plymouth; and Prof. J. Wortley Axe, London.

Apologies for non-attendance were received from Messrs. F. T. Harvey, W. H. Bloye, C. Parsons, J. Vickery, W. Roach, W. H. Davidson, and Wm. Ascott.

Devon County Council Scale of Fees, Etc.

The Committee appointed to consider this subject presented their report, and the following resolution was proposed by Mr. Thorburn, and seconded by Mr. R. E. L. Penhale and carried.

"The members of the Western Counties V.M.A. consider the present scale of fees allowed to veterinary surgeons by the Devon County Council altogether inadequate. They suggest that the scale should be revised and similar fees to those paid by the Cornwall County Council be granted, viz., £1 1s. for each investigation, and 1s. per mile one way as travelling expenses. They further strongly protest against their opinion being submitted to or questioned by a gentleman who is not a qualified veterinary surgeon."

Election and Nominations.

Mr. W. H. Davidson, Wellington, (proposed and seconded at the last meeting) was elected a member of the Association.

Mr. Charles Colin Parsons, Launceston, and Prof. John Dunstan, Liskeard, were proposed by the President and seconded by Mr. W. Penhale.

It was decided to hold the next meeting at Taunton.

PRESIDENTIAL ADDRESS.

By G. H. Gibbings, F.R.C.V.S., Tavistock.

Gentlemen,—I offer no apology for occupying the proud position as your President for the ensuing year, as I presume that office falls to me by virtue of seniority of membership; at the same time I am deeply conscious of its legitimate responsibility.

I feel that this and kindred associations are passing through a somewhat critical period; there is often apathy and a regrettable lack of interest manifested in the proceedings of the Association; the attendance at times is quite disheartening. It may be a question in the near future whether it will not be desirable to hold only two meetings a year as formerly. This would be a retrogade step and one which I am sure we should all deplore. Such gatherings as these are rightly intended to promote the highest and best interests of the profession, and if individual members would be more practical in their endeavour to carry out this ideal, we should have no reason to alter our present arrangement.

I hope you will not think I am attempting to establish a dangerous precedent in departing from the usual custom of delivering a long and tedious address. As a rule such addresses contain no topic of particular interest, but are tiresome repetitions, pessimistic discourses, and our time might be more profitably engaged in discussing the subject matter of our essay.

Most of us no doubt in quietly perusing the reports of this and like societies have observed that very important points in the essay have been altogether missed in the discussion. Other interesting matters too have received but scant notice. Valuable light might often be thrown on an abstruse subject, and erroneous theories exploded, if the thesis were discussed in detail. I would suggest that the papers should be printed and circulated among the members prior to the meetings. Then I venture to predict the various points introduced would be much more fully discussed, with the result that more profitable information would be obtained, consequent on greater opportunity for matured thought.

Those of us who act as veterinary surgeons to the Devon County Council were no doubt astonished to read the circular recently issued by the order of the Council to the Superintendent of Police, directing them to forward to the Borough Analyst at Exeter for his examination a portion of the carcase of any animal in which anthrax had been suspected. It would be interesting to know what superior qualifications this gentleman possesses to be considered an expert bacteriologist. Should his opinion be in disagreement with the local V.S., would the County Council accept the responsibility of allowing the owner to dispose of the carcase in whatever manner he might select? Whenever any of us with a due sense of responsibility and with fuller knowledge should diagnose anthrax, it is humiliating that our opinion should be liable to contradiction by a gentleman who however skilled in his own work has no claim to be a specialist in veterinary science. We must expect no favours from the Devon County Council, nor indeed do we desire any. The only way in which we shall get bare justice is by presenting a united front and using a little tactful coercion.

In my opinion the regulations dealing with the disposal of animals that have succumbed to anthrax are open to improvement. To cremate every case indiscriminately is costly, and not always a necessary process. In places where the soil or surrounding circumstances are unfavourable to interment, burning is essential. But if the carcase can be buried intact to a depth of about six feet I do not consider there is danger of any infection being conveyed from it

It is customary on such occasions as these to criticise the actions of the Board of Agriculture, and in this direction I will adopt the usual course. I consider that the Board made a wise choice in their selection of such an able man as Prof. Stockman to occupy the important position of their Chief Veterinary Officer. I am hopeful now of seeing some tangible results follow on his appointment. We are about tired of hearing it repeatedly hashed up before the public what extraordinary skill and foresight the Board have displayed in stamping out cattle plague, pleuro-pneumonia, foot-and-mouth etc., but we are more directly concerned with their present work and future programme. It certainly reflects anything but credit on the Board of Agriculture that such diseases as contagious abortion, the various forms of influenza, tuberculosis, and mange should be permitted to work such havoc without even an attempt to limit their ravages. One is glad to see that at last a departmental committee has been appointed to enquire into one of these diseases.

It is a source of amusement to me to read the number of outbreaks of swine fever tabulated week after week. I do not accept them as a reliable guide to the prevalence of the disease, as a large number of cases never come to the knowledge of the Board. If the officials imagine they will stamp out swine fever without the co-operation and support of the local veterinary surgeon they labour under a great delusion. I know the general practitioner has been uncharitably branded as incompetent. Probably errors in diagnosis have occurred, but these mistakes have been oftener central than peripheral. Too much responsibility is vested in the police. At present it is left to their discretion to report or otherwise cases of illness or death in pigs. It is needless to dwell on the folly of such a procedure, and the frequency in which centres of infection thereby remain unnotified.

A life devoted to the alleviation of pain and suffering in animals is a noble calling. Perhaps in many instances we are not adequately remunerated for our services, but apart from any pecuniary consideration it is a duty we owe to our patients to use every available means to bring our cases to a successful issue.

I note with regret the tendency of the age is drifting towards materialism; this is especially evident in so-called scientists—men whose knowledge comparatively speaking does not extend beyond the proverbial droplet in the big ocean. I hope this spirit will not pervade the veterinary profession, for it would have a tendency to make us callous and flippant, and therefore un-

sympathetic in the treatment of many cases which might come under our care.

Gentlemen, I have dealt very briefly with a few topics which I thought might prove of interest to you. I hope we shall spend a truly enjoyable and profitable time together, and that the Society will not suffer through any inability on my part to fully discharge the duties associated with the chair.

ABORTION IN CATTLE.

By Professor J. Wortley Axe.

Of the many questions which from time to time force themselves on the attention of the profession, Abortion in Cattle still offers us matter for reflection, and I have elected to bring it once again to your notice for consideration and discussion.

You may have had your attention drawn to it on many former occasions, but I venture to think that not one of you has formed a clear and definite idea as to its nature and pathology.

That the malady is contagious you will probably have assumed from circumstances in your own exxperience, but I think you will admit, as I shall have to do, a more or less complete want of scientific knowledge in regard to it, and this notwithstanding that every year, and for many years, abortion in cattle has been much in evidence. Again and again have the veterinary and lay press in turn devoted long and exhaustive articles on its obscure and subtle nature, and recorded with more or less approval the experiments and experiences of Home and Continental observers.

As long ago as 1786 Cl ter recognised its "epidemical character," and Youatt (1834) from clinical considerations regarded it as contagious. Boulay in 1863 remarked its frequent occurrence on the introduction of fresh cows into a herd, and in 1873 Dr. Fleming concluded a lengthy article on infectious abortion by saying, "without going further into the question, and without taking into consideration other agencies which may cause extensive abortion, such as ergotised grasses, it may be concluded that this kind of miscarriage is transmissible through the medium of some infection or virulent principle which is really specific in its nature." At this time and for ever afterwards Fleming was deeply impressed with the conviction that abortion was contagious, and I have no doubt you all think so, and everybody else who has given the matter a moment's thought entertains the same opinion.

With these remarks we go on to consider what has been done in the direction of demonstrating the actual cause of the disease.

Nocard's Enquiry.

In December, 1885, Prof. Nocard received a commission from the Minister of Agriculture of France to study the question of abortion and if possible to ascertain the causes of the disease and the means by which it might be avoided. As a result of his investigations Nocard came to the conclusion that abortion was a contagious affection resulting from the presence of microbes, and this opinion was reached notwithstanding much evidence to the contrary obtained by a commission upon the subject, in which the testimony of numerous veterinary surgeons was obtained. This evidence, when analysed, could be brought under the three following groups :—

1. "The cause of abortion is believed to be precocity and a tendency to fatten; qualities which can only be acquired at the expense of restricting any capacity for procreation."
2. "It is believed that to crossing, and especially to crossing with a shorthorn bull, abortion is to be attributed."
3. "The smaller number of experts believe that abortion is owing to the ingestion of grasses upon which are developed fungi analogous to the ergot of rye."

All these views are combated and laid aside as of inferior importance.

Prof. Nocard then refers to the frequent occurrence of the disease following upon the introduction of a fresh animal into the herd and the order of the spread of the affection to those standing near to it. He also remarks upon the long period of incubation which the disease engages, and he notes that healthy cows when due to calve seldom abort when introduced into an infected stable, but that animals bulled on the premises usually contract the disease and part with their young.

Prof. Nocard, speaking of the period of abortion says it seldom appears before four months of gestation, and that the term becomes longer with each subsequent pregnancy until the calf is carried through the full period of gestation. But he observes that calves from cows which go their full time die of diarrhœa, and that the cause of this disease in the calf is the same as that which produces abortion. He says they do not suck, and they bellow in a particularly disagreeable manner.

In discussing the question as to the organic changes which excite abortion Professor Nocard says, "The condition of the cow is not in any way affected. In the urine, blood, and milk, there is nothing to be found of an abnormal character, and a post-mortem examination reveals no disease whatever."

When the pus-like juice and the uterine mucus were submitted to microscopic examination, "the former presented a large number of micrococci together with some bacilli; in the cotyledon juice were numbers of bacilli with very few micrococci, while the juice obtained by scraping gave both organisms in about equal quantities. When bouillon was sown with cotyledon juice and cultivated for forty-eight hours the bacilli mentioned above appeared almost in a state of purity, while that which was inoculated with the pus developed both organisms, and no organisms at all were found in the bouillon which was inoculated with the blood and milk."

A cow having aborted several months ago and refused to take the male was killed for the butcher. Her viscera and uterus were normal, but a liquid obtained by scraping the mucous membrane of the uterus was slightly acid and swarmed with microbes.

Nocard points out that the uterus of aborting cows always contains micro-organisms, whereas that of a healthy beast does not contain any, nor is the uterine liquid acid. He attributes the repeated return to service and the sterility which follows upon abortion to the presence of acid in the uterus which he says "destroys the vitality of the spermatozoa."

In endeavouring to decide whether abortion was the result of disease of the fœtus or its envelopes, the viscera and various fluids of aborted calves were carefully examined. No micro-organisms were found in any of them. When, however, the digestive canal was inspected it was found to contain numerous microbes of various species either in the intestinal liquid or in the mucous membrane. As the alimentary canal does not contain organisms before birth and under circumstances of health, their presence may be considered as an incontestible sign of the epizootic nature of abortion, and it also explains the diarrhœa which causes the death of calves, and the rapid putrefaction of the fœtus.

Nocard has no doubt established several very important points bearing upon this disease, but he has not differentiated the organism out of which it is said to arise. It is most likely that among the various species of microbes found in the digestive canal of the calf the offending organism existed, but it was not distinguished

from the rest, either morphologically, or culturally, or otherwise.

Bang's Enquiry.

In 1897 Bang, of Copenhagen, undertook an enquiry on very much the same lines and with the same object in view. In the course of it he came to the conclusion that the disease was not, as had been affirmed by Nocard, confined to the fœtal membranes, but that the uterine mucous membrane was in a catarrhal condition, and that this was determined by a definite species of bacterium which he affects to have discovered. Moreover, Bang was of the opinion that the very abundant exudate which contained a quantity of epithelial cells, pus cells, must occasionally have been furnished by the uterine mucous membrane, and not by the thin chorion, and consequently the disease, must be regarded as uterine catarrh.

Here we have two distinguished pathologists differing at the outset of their enquiry as to the seat of the disease.

Nocard found the fœtus and the fœtal membranes to be diseased, while in addition to these, Bang also includes the mucous membranes of the uterus of the dam.

In December, 1895, Bang procured a five-year-old cow which had been bulled on the 21st of May, and which had shown premonitory signs of abortion. This cow was slaughtered, and the uterus was removed after ligaturing the vagina.

On dividing the uterine wall a dirty yellow, somewhat thin pultaceous material, of a slimy, somewhat lumpy character, was found to exist between the mucous membranes and the fœtal envelopes. Its reaction was alkaline. (Here again the statement by Nocard that the uterine reaction in these cases is acid, is contradicted by Bang). The sub-chorial tissue was œdematous and the umbilical cord was similarly affected.

A cover glass preparation made from the exudation matter referred to above was stained with Loeffler's methylene blue, and when examined a very small bacterium was observed in large numbers and in dense clumps. These had for the most part the appearance of cocci, but some were of a longer shape. Close examination under great magnification, however, showed them to be small bacilli, in the interior of which were one or two, or more rarely three, roundish elongated granules situated at the extremities of the organism. The bacilli are non-motile, they vary in size, but the largest examples are about as long as tubercle bacilli.

The discovery of this bacillus Bang says "indicates that epizootic abortion ought to be regarded as a specific uterine catarrh determined by a definite species of "bacterium." He admits that the uterine mucous membrane was not strikingly altered, and points out that chronic catarrh is not necessarily associated with startling anatomical alterations.

The question between Bang and Nocard in regard to this matter is clearly one of identity. Did Nocard overlook the abundant exudate—the shed epithelial cells, which Bang says were furnished by the uterine mucous membrane, and which in his view must be regarded as results of uterine catarrh?

Bang says that a chronic catarrh is not necessarily associated with striking anatomical alterations. That may truly be so, but is this condition so obscure as to have escaped the attention of Nocard in the numerous cases of abortion which passed before him?

Bang caused cultivations to be made in serum-gelatine agar and reproduced the small bacillus he found in the uterine exudate. On subsequently examining cover-glass preparations of exudate from the uterus of aborted cows, and specimens from a number of fœtal membranes, the same organism was found either "as isolated individuals, or collected together in intracellular heaps."

The difficulty attending the finding of the bacilli is pointed out, but ordinarily when the exudate contains "greyish white granules which may be picked up with a needle" they are easily identified among other bacteria of various kinds which had entered the uterus after it had been opened.

Pure cultures were also obtained from the contents of the intestines of the fœtus, and in another calf from the fœtal blood and medulla oblongata, also from the 4th stomach, and the intestinal contents. Clearly if this organism is the cause of the disease the fœtus is undoubtedly shown to be a subject of it.

We must not forget in considering this part of the subject that Nocard's organism, whatever it may have been, was also found with the various microbes contained in the stomach of the fœtus, and he also cultivated a micrococcus from the medulla oblongata.

Mummified Fœtuses.

In some cases where the fœtus had been retained and became mummified Bang found the organism to which he refers the disease. A cow which had calved in October, 1893, and aborted in September, 1894, repeatedly returned to the bull, and as she did not conceive was put up and fattened. When destroyed the uterus was found to contain a mummified fœtus, about 9 inches long and closely invested by the fœtal membranes. Here, from the brownish tenacious exudate by which it was surrounded, a pure culture of the abortion bacillus was obtained in agar serum. It is noted that nothing could be found in the cover-glass preparation; the growth was unusually slow in developing, and even after nine days incubation the organisms were few in number. Upon this Bang observes that the uterine catarrh which is set up by the abortion bacilli does not always entail the expulsion of the fœtus, but that the result is sometimes merely its death. The circumstances of the second case were much the same as those just referred to, and need not be detailed.

A point of very considerable importance in relation to the treatment of the disease arises out of a consideration of these mummified fœtuses, inasmuch as they show to what extent under favourable conditions "the organism of abortion" may retain its vitality. Bang estimates that in the first case a period of nine months had elapsed between the death of the fœtus and the time when the organism was found in the exudate surrounding it. This conclusion is reached by assuming that the cow was bulled in December, 1894, or January, 1895, and the death of the fœtus had taken place in May or June, 1895. The uterine exudate inoculated into agar-serum produced a perfectly pure culture of the abortion bacillus in March, 1896.

Although these organisms would appear to have retained their vitality in the uterus for periods varying from nine to seven months, we are not told for how long they retained their infective properties, and remained capable of producing the disease, but it may be gathered from Bang's remarks that in this respect their virulence was not impaired. If this be so it serves to explain why cows which have aborted return to the bull again and again, and why abortion is so frequently repeated at an advanced period of gestation. Further, it offers an explanation of the difficulty experienced in removing the disease from a byre in which it exists.

The invariable occurrence of the bacillus which was discovered in the catarrhal exudate of the uterus of aborted cows rendered it probable that the cause of the disease had been discovered, and it only then remained to excite the malady in a healthy cow by introducing it into a pregnant animal.

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Injection of the discharge from cows which have aborted into the vagina of healthy pregnant cows.

This is said to have been done by several veterinary surgeons on the Continent, who have introduced either the discharges from the vagina, or parts of the fœtal membranes of aborted cows into the vagina of healthy ones, with the result of exciting the disease in the latter. This, however, has not been uniformly the case in this country.

In some experiments performed by Prof. M'Fadyean and Dr. Woodhead for the Highland and Agricultural Society, positive results were obtained on two occasions, but whether infection was induced in this way or not it is difficult to say, seeing that experimental cows were placed in a byre in which a large number of cows had recently aborted. In addition to this a cotton wool plug that had been kept for 90 minutes in the vagina of one of the recently aborted cows was introduced into the vagina of the experimental cow and left there "for some hours." Twenty days afterwards the cow calved, two months before her proper time. The calf was alive when born but survived only a short time.

But little importance can be allowed to attach to this experiment. The result may have been due to infection from the stable in which the animal was placed, or it may have been due to the irritation caused by the pad of wool, quite apart from the matter with which it was soaked.

In the next experiment a small quantity of vaginal discharge was injected under the skin of the labia of a pregnant cow, which, as in the cow engaged in the previous experiment, was also housed in a byre where a number of cows had recently aborted. The result was a premature birth two months afterwards and one month before full time.

In this connection my own experiment had a negative result. Here a dram of thick glairy discharge taken from the vagina of a cow that had aborted about six hours before was rubbed up with a little warm water and injected into the vagina of a cow from healthy stock. At the same time another portion was inoculated into the skin of the vagina by superficial scratches. The cow completed the period of gestation and produced a healthy bull calf.

Similar experiments were performed by a Committee of the Royal Agricultural Society of England also giving negative results.

In the first of these the vagina of an aborted cow was syringed out with plain water, and immediately afterwards this water (about half-a-pint) was injected into the vagina of a healthy cow supposed to be in her sixth month of pregnancy. The cow that had aborted came from a herd of about 170 cows in which during the preceding year there had been 26 cases of the disease. The experimental cow gave birth to a healthy looking and vigorous calf, and the placenta was not retained.

In the second experiment, the cow that aborted came from the same herd as the cow used in the previous experiment. The vagina was syringed out with plain water as in the previous case, and the water was injected into the vagina of a cow supposed to be in her sixth month of pregnancy. A healthy, apparently full-grown calf was born on February 1st.

We are naturally led to ask why these experiments which were deliberately carried out should have yielded a negative result. That abortion did not follow them seems to suggest one of several conclusions—either that the vagina did not contain the virus at the time of being washed; or that the animals into which it was injected were not susceptible of the disease; or that its vitality or pathogenetic power had been diminished or destroyed; or that the lapse of 12 and 14 days between the cows aborting and the experiments had in some way arrested its action.

Whether any of the facts, and which, had influence in determining the result must be left for future enquiry. Judging by my own experiment, where the matter used for inoculation was removed six hours after the animal had aborted, and in the experiments of the Agricultural College at Wye now to be recorded, the result can hardly be looked upon as influenced by the time when the matter was taken from the infected cows.

While abortion was running its course in the dairy herd of Mr. Holm, of Buckland, Surrey, advantage was taken of the opportunity to carry out certain experiments at Wye. Among them it was considered desirable to test the virulence of the uterine discharges of a recently aborted cow, and for this purpose two shorthorn heifers were selected. No. 1 was served on Sept. 5th and No. 2 on October 2nd. 1899. On the 11th of December the vagina of a cow which had just aborted was syringed out with clean water. On the following day the water was raised to the temperature of the body (by immersing the vessel containing it in warm water) and divided into equal parts, one of which was injected into the vagina of each of the two heifers.

On the 5th of February No. 1 came bulling, and was found not to be in calf. She was again bulled, and calved down after going her full time.

No. 2 gave birth to a healthy calf, after carrying it the full period of gestation.

Injection of pure cultures into the vagina.

To these experiments must be added those of Bang, in which *pure cultures* of the "abortion bacilli" were injected into the vagina of two pregnant cows. These cows were afterwards killed, one on the nineteenth and the other on the twenty-ninth day following, with the result that not the slightest pathological change was found either in the uterus or the mucous membranes.

Insertion of after-birth into vagina.

Subsequent to this, part of the after-birth from cows that had aborted was introduced into the vagina of two pregnant cows. When these animals were slaughtered afterwards, on the thirty-third and the thirty-fifth day respectively, no lesions were found to exist in either of them.

Bang offers an explanation of these negative results by saying that probably the cows used in the experiments might have come from infected stocks and have repeatedly aborted and thereby contracted an immunity. It would of course be just as reasonable to say that they might not have done anything of the kind.

Then, referring to the experiments performed by the Committee of the Highland and Agricultural Society of Scotland, in which the incubation period extended from five and a half to ten weeks, he says:—"It appeared quite reasonable to suppose that our experimental cows would have aborted if we had not slaughtered them so soon, and that we did not find the slightest trace of uterine inflammation might perhaps be explained by supposing that the bacilli had not yet passed into the uterine cavity."

I do not see any reason why these cows, if they were susceptible to the action of the virus, should not have contracted the disease, especially having regard to the results which attended similar experiments by Brauer and Lelmert, in which it is said the cows aborted in from nine to twenty-one days afterwards. As matter of fact, whatever the explanation may be, these cows, like the one in my own experiment, and like those at the Wye College which were not killed at all, remained proof against the matter injected into the vagina.

Further Injection of pure cultures into the vagina.

Disappointment with the result of his former experiments led Bang to procure two cows from a herd in

which abortion was not known. One of them was four years old and the other seven. They had been bulled on the 14th and 16th of January respectively.

Into the vagina of each of these animals he injected a "rather large quantity" of pure culture of the "abortion bacillus" passing it well forward to the anterior part of the canal. As nothing occurred during the first five weeks after the injection it was feared that the experiment would miscarry. Whereupon it was repeated on the 23rd of May.

On the 23rd of June, being a month after the last injection, the seven-year-old cow displayed some indications of abortion. The pelvic ligaments became relaxed there was an œdematous swelling of the labia and a slight flow of mucus from the vagina.

On the same day the four-year-old cow showed slight œdema of the lower parts of the labiæ, but the pelvic ligaments were still firm. On the following day this cow aborted a dead calf which was then five months old. The claws were loose and the cornea opaque, showing it to have been dead for some time. The fœtal membranes were retained and when removed the chorion was observed to be much injected, and in other respects the symptoms were the same as had been noted in previous cases of abortion. The exudate contained the abortion bacilli together with other bacteria, which, it is said, had found their way into it during the six hours after the act of abortion.

It must here be noted that *two* lots of *pure cultures* were used in these experiments and injected in *large quantities* into the vagina.

The seven-year-old cow was slaughtered on the 24th of June, and from the unopened uterus an exudate was removed in which the "abortion bacillus" was present and from which pure cultures were obtained. The fœtus was alive when the cow was slaughtered.

On the 19th of January a culture of the "abortion bacillus" was injected into the vagina of a six-year-old pregnant cow. This was followed on the 16th of March with a *subcutaneous injection* of the abortion bacillus which produced a sharp attack of fever which lasted for three days. She calved at her full time on the 9th of April, and the calf was slaughtered fourteen days afterwards, while suffering from an attack of diarrhœa. The exudate from this cow contained "abortion bacilli."

Natural Mode of Infection.

Speaking of the natural mode of infection, Bang observes that it is extremely likely that the agent of infection is as a rule taken in by the external parts of the genital organs of the cow being brought into contact with infected objects during her sojourn in the byre. In this connection several experiments have been performed in this country which I propose to record.

The following are by a Committee of the Highland and Agricultural Society of Scotland.

Experiment 1. A cow that had recently aborted was placed for one month in a loose box at the Edinburgh Veterinary College with a healthy pregnant cow.

The result of the experiment was negative, the healthy cow dropping a healthy calf at full term.

Experiment 2. This experiment was a repetition of the former with a similar negative result.

Experiments by a Committe of the Royal Agricultural Society of England.

Experiment 1. December 22nd, 1894, a heifer supposed to be about four months in calf was stalled with a cow that had aborted (at the sixth month) six days previously. The cow that had aborted came from a herd of about thirty cows in which three cows had aborted in 1894, and three in the previous year.

On the 9th of February this cow aborted a dead fœtus about six or seven months old. The fœtus was quite fresh, but attempts to cultivate bacteria from it failed.

Experiment 2. February 19th, 1895. The heifer used in the preceding experiment which remained in the loose box in which she had aborted had placed along with her a heifer supposed to be in her sixth month of pregnancy.

On the 21st of April this heifer calved a full term calf.

Experiment 3. January 27th, 1895. A heifer that had aborted was stalled along with a cow supposed to be six months in calf. The heifer had aborted about a week previously and came from a farm at which, in a herd of about 40 cows, over 30 cases of abortion had occurred during the previous eighteen months.

On the 19th of April this cow calved a vigorous apparently full term calf.

Experiment 4. April 5th, 1905. A cow that had aborted about a fortnight previously was stalled along with a pregnant cow (stocked December 27th, 1894). This cow that had aborted came from a herd in which twelve out of thirty cows had aborted during the previous twelve months.

A healthy calf was born on the 8th of October.

Experiment 5. A cow that had aborted eight days previously (between the seventh and eight month) was stalled along with a cow supposed to be four months gone in calf. The cow that had aborted came from a herd of twenty-six, in which eight cows had aborted during the previous nine months.

A vigorous apparently full term calf was born on the 14th of December.

The experiments carried out at the South Eastern Agricultural College had for their object to show if cohabitation with a recently aborted fœtus would induce abortion in pregnant cows.

Two shorthorns from a healthy herd were placed in a small yard with an open shed. No. 1 was served on the 16th of May, 1899, and No. 2 on June 26th.

On the 22nd of August a fœtus which had been aborted the previous day was divided into several pieces and placed in different parts of the yard and shed. On the 24th a second aborted fœtus was distributed through the shed in the same way; and in another fortnight a third was similarly dealt with.

Both experimental cows completed their terms of gestation and brought healthy calves.

It will be seen from the above that however true it may be to say that the causative organism has been identified by Bang there is still much contradictory evidence requiring to be explained, and to this probably the attention of the recently appointed Commission to enquire into abortion will be specially directed.

Discussion.

Mr. Olver said his father many years ago kept Herefords. The first case of abortion was introduced on the farm by a young heifer. It caused great trouble in the herd, and still continues to do so. Unfortunately he removed some of the herd to another farm and introduced the disease there as well. He had noticed that after the third time of aborting the cow would hold, and could be kept on without again aborting.

Mr. Oliver thanked Professor Axe very much for his excellent address on a most interesting subject. He was sorry he could not add much to the discussion, but it was his experience that attention to the external organs was of very little use in checking the disease.

Mr. R. E. L. Penhale advised every attention being given to the external organs washing them with a solution of corrosive sublimate, and also injecting some of the same solution. He could strongly recommend a Higginson's syringe for injecting the sheaths of bulls. He found that with a little care they took it quietly enough.

Mr. John Dunstan said he had no settled idea as to the cause of abortion or the treatment of it. He had

not had any good follow the giving of carbolic acid in the food.

Mr. THORBURN advocated the use of antiseptic injections, and the separation of a cow which aborted from the rest of the herd immediately.

Mr. W. PENHALE mentioned numerous supposed remedies, and amongst others the old fashioned one of keeping a Billy goat with the cows. In his opinion bulls played a very important part in propagating the disease.

Mr. BOND gave an instance where abortion occurring frequently on a farm the superstitious owner made a burnt offering of the body of an aborted calf as a kind of sacrifice to appease the disease, and the whole of the cattle were driven into the farmyard at the time. Singularly enough the abortion was said to have at once ceased. The disease affected all breeds of cattle, pedigree as well as non-pedigree, and so far as he knew no treatment had yet been found to be reliable.

The PRESIDENT said he was rather disappointed with the discussion. He felt quite convinced the disease was of a contagious nature, and he was fully assured that disinfection from the third to the eighth month by washing and syringing twice a week was beneficial. He did not believe the contagium was conveyed by the bull. The great remedy, and the best, was to cease breeding for two years on an infected farm.

Prof. AXE, in reply to the few observations which had been made, was of opinion that legislation on a subject so little understood and so seemingly contradictory in its detail would be very difficult at any time, and at present impossible.

A vote of thanks, proposed by Mr. W. Penhale, seconded by Mr. P. G. Bond, was heartily accorded the Professor for his kindness in coming so far to address the members (his old pupils with one exception, Mr. Olver, who was an old College chum) on such an obscure subject, and one so greatly affecting the agricultural interest.

Prof. AXE, in his reply, thanked the members for their kind attention and their welcome to Tavistock, and hoped that he would again have the pleasure of meeting them on some future occasion.

A cordial vote of thanks to the President terminated the meeting.

High tea followed.

The attendance was rather small, probably owing to the meeting coming so soon after the "National" at Buxton.

THE ADVANCE IN OUR KNOWLEDGE OF THE CAUSATION AND METHODS OF PREVENTION OF STOCK DISEASES IN SOUTH AFRICA DURING THE LAST TEN YEARS.—By Col. D. BRUCE, F.R.S. President of the Section of Physiology.*

(Continued from p. 168.)

REDWATER OR TEXAS FEVER.

This was a most interesting disease and of great importance to stock farmers. It only affected cattle. It was found in almost every part of the world. It was first studied in North America; hence the name Texas fever. To Kilborne and Smith was due the honour of elucidating the causation of this disease, and their work formed one of the most interesting chapters in the history of pathological science. They discovered that it was caused by the presence in the red blood corpuscles of a protozoal parasite closely related to the parasite found in East Coast fever—the *Piroplasma parvum*. This organism is called *Piroplasma bigeminum*. They further discovered that this parasite was conveyed from sick to healthy cattle by means of a tick. Texas fever was introduced about 1870, and was now endemic throughout most of South Africa. For many years the native cattle had been immune to the disease; on account of being born and bred in a Texas fever locality they had inherited a degree of resistance to the disease which enabled them to pass through an attack when they were young, and so they became immune. But there was one peculiarity about Texas fever which did not occur in Rhodesian tick fever, and that was that the blood of an animal which had recovered from Texas fever remained infective—the germs remained latent—and so the native cattle of South Africa, although apparently healthy, were capable of infecting imported susceptible cattle with this very fatal malady. This is what made it so difficult to import prize stock into this country. This disease had become of secondary importance to South Africa in these days. The native cattle had become naturally immune, and the disease was only fatal to susceptible imported cattle. This, of course, discouraged the importation of prize stock. In regard to methods of conferring immunity on susceptible cattle many had been tried, but none were absolutely free from risk.

BILIARY FEVER.

This was a disease of horses, mules, and donkeys very similar to redwater in cattle, and was caused by a closely allied parasite, the *Piroplasma equi*, discovered for the first time in South Africa by Bordet, Danysz, and Theiler, and named by Laveran of Paris. It was similar to redwater, in that animals which had recovered from the disease remained a source of infection during the remainder of their lives to susceptible animals. The native South African horse was, like the cattle, immune to the disease. It was also conveyed by a tick, which had been shown by Thelier to be the "red tick" (*Rhipicephalus evertsi*), the infection being taken in the nymphal and transferred in the adult stage. Theiler had also made the very important observation that if a horse were injected with blood from a donkey which had recovered from the disease, as a rule a mild form of the disease would be produced, so that this opened up a method of immunizing susceptible horses which might probably prove of practical value.

TSETSE-FLY DISEASE.

This fly rendered thousands of square miles of Africa uninhabitable. No horses, cattle, or dogs could venture, even for a day, into the so-called "Fly Country." Now what was our knowledge of this disease ten years ago? At that time it was thought that the tsetse-fly killed animals by injecting a poison into them, in the same way as a snake kills its prey. Nothing was known as to the nature of this poison in 1894. In 1895, on account of serious losses among the native cattle in Zululand from this plague, the then Governor of Natal and Zululand, Sir Walter Hely-Hutchinson, started the investigation of this disease. The result of this investigation was the discovery that tsetze-fly disease was not caused by a simple poison elaborated by the fly, as formerly believed, but that the cause of the disease was a minute blood parasite which gained entrance to the blood of the animals. This parasite was known by the name Trypanosoma, which signified a screw-like body. Ten years ago two species only had attracted much attention—one living in the blood of healthy rats, discovered by Surgeon-Major Lewis in India; and the other, a trypanosome, found in the blood of horses and mules suffering from a disease known in India as "Surra." As the result of this investigation in Zululand, which lasted two years, it was proved that this trypanosome was undoubtedly the cause of the death of the horses and cattle struck by the fly, and that the tsetse-fly merely acted as a carrier of this blood parasite. These trypanosomes

* At the meeting of the British Association, Johannesburg, S. Africa, Aug. 29.

consisted of a single cell ; were sinuous, worm-like creatures, provided with a macronucleus and a micronucleus, a long terminal flagellum, and a narrow fin-like membrane continuous with the flagellum, and running the whole length of the body. When alive they were extremely rapid in their movements, constantly dashing about, and lashing the red blood corpuscles into motion with their flagellum. These organisms multiplied in the blood by simple longitudinal division, and often became so numerous as to number several millions in every drop of blood. They were sucked, along with the blood, into the stomach of the fly, lived and multiplied in the alimentary tract for several days, and, when the fly had its next feed on an animal, took the opportunity of gaining access to the blood of the new host, and so set up the disease. Experiments were made which showed that the fly could convey the parasite from affected to healthy animals for at least 48 hours. Lately, however, evidence had been brought forward to show that an enormous multiplication and development of the trypanosomes took place in the fly's intestine, a few trypanosomes multiplying to masses containing numberless parasites within 24 hours. This multiplication of the trypanosomes in the tsetze fly was discovered by Gray and Tulloch, two young Army medical officers, while working in Uganda on "Sleeping Sickness" during the present year. Not only was it found that the tsetse-flies could convey the disease from sick to healthy animals, but it was also proved that the wild tsetse-flies brought from the "Fly Country" and straightway placed on healthy animals also gave rise to the disease. The question then arose as to where the tsetse-flies living in the "Fly Country" came by the trypanosomes. There were no sick horses or cattle in the "Fly Country." Investigation brought to light the curious fact that most of the wild animals—the buffalo, the koodoo, the wildebeeste—carried the trypanosomes in small numbers in their blood, and it was from them that the fly obtained the parasite. The wild animals acted as a reservoir of the disease. The discovery that the wild animals acted as a reservoir of the disease accounted for the curious fact that tsetse-fly disease disappeared from a tract of country as soon as the wild animals were killed off or driven away. In 1895 the living trypanosome which causes the tsetse fly disease was sent to England in the blood of living dogs, in order that it might be studied in the English laboratories. These trypanosomes had been kept alive ever since by passage from animal to animal, and had been sent all over Europe and America, so that our knowledge of this kind of blood parasite had rapidly grown. Since 1895 many other trypanosome diseases had been discovered in all parts of the world. The latest and most important of these was one which affected human beings, and was known as "Sleeping Sickness." This "Sleeping Sickness," which occurred on the West Coast of Africa, particularly in the basin of the Congo, had within the last few years spread eastward into Uganda, had already swept off some hundreds of thousands of victims, was spreading down the Nile, had spread all round the shores of Lake Victoria, and was still spreading southward round Lakes Albert and Albert Edward. This disease was in all respects similar to the Nagana, or tsetse-fly disease of South Africa, except that it was caused by another species of trypanosome and carried from the sick to the healthy by means of another species of tsetse-fly—vis., *glossini palpalis*. To sum up, then, the increase in our knowledge of tsetse-fly disease during the last ten years, we might say that we had discovered the cause in the shape of the small blood parasite Trypanosoma ; we had found that the reservoir of the disease existed in the wild animals, and that we could blot out this disease from any particular tract of country by the simple expedient of destroying or driving away the wild animals. We still had no means of preventive inoculation or successful medicinal treatment in this disease. Trypanosomiasis of cattle was of no great practical importance.

Horse-sickness.

This was a disease which only affected equines—the horse, mule, and rarely the donkey. It was a very fatal disease, carrying off thousands of horses every year. It was one of the most important diseases in South Africa, and if it could be coped with would enable the Transvaal to become one of the best horse-breeding countries in the world. At present it was dangerous for any one in Natal and many parts of the Transvaal to possess a valuable horse, the chances of losing it by horse-sickness being so great. In 1895, when he went to the north of Zululand with the Ingwavuma expedition, they lost all their horses with this disease. They started with 100 horses, and had to march back on foot, every horse having died. Ten years ago our knowledge of this disease was confied to the disease itself ; nothing was known as to its causation or prevention. Credit was due to Dr. Edington for having accurately described the lesions and shown its ready inoculability, period of incubation, etc. He, however, fell into the mistake of attributing its causation to a species of mould fungus. Horse-sickness was widely distributed throughout Africa. It was common in Natal, Zululand, the greater part of the Transvaal, Rhodesia, Bechuanaland, and Portuguese East Africa. In Cape Colony it occurred in epidemics, with intervals of ten to twenty years. It prevailed chiefly in low-lying localities and valleys, and was but rarely met with in elevated exposed positions. It, however, was met with now and then in river valleys up to an elevation of some thousands of feet. Season had also a remarkable influence on its development, being exceedingly common in summer and disappearing on the appearance of the first frosts of winter. It was known ten years ago not to be contagious in the ordinary sense of that term ; that was to say, a horse could be stabled alongside a case of horse-sickness without incurring the disease, or a horse might be placed without danger in tbe same stall in which a horse had recently died of horse-sickness. A horse which had been exposed to infection showed no signs of the disease for about a week. Its temperature then went up rapidly and it died after four or five days' illness. Very often the horse appeared perfectly well until within a few hours of death. There could be no doubt that this disease, like the tsetse-fly disease, was caused by some form of blood parasite. A small quantity of fluid taken from any part of a horse suffering from horse-sickness was capable of giving rise to the disease if injected under the skin of a healthy horse. Now, although every drop of blood must contain many of the organisms of this disease, yet the most careful examination of such blood under the highest powers of the microscope revealed nothing. Again, if we filtered horse-sickness blood through a porcelain filter—a filter which was capable of keeping back all the known visible micro-organisms—the filtrate was found to be virulent. It was evident, then, that we were here dealing with a blood parasite so small in size as to be absolutely invisible to the highest powers of the microscope, and also so minute as to readily pass through the pores of a Chamberland filter. What the nature of this parasite was one could not tell. It behaved in many curious ways. For example, horse-sickness blood which was simply dried and pounded into powder was found to be perfectly inert. On the other hand, blood kept in the moist condition remained virulent and capable of giving rise to the disease for years. The question now arose as to how horses were infected by this disease in Nature. On account of the small quantity of blood which will give rise to the disease if injected under the skin, and the large quantity required before the disease

could be conveyed through the stomach, for a long time it had been supposed that it must be conveyed from sick to healthy horses by means of some biting insect. Experiments had been made within the last few years by Watkins-Pitchford and others in order to clear up this aspect of the question. Horses had been placed in fly-proof shelters in exceedingly unhealthy places, and it was found that in no case did any of these protected horses incur the disease; whereas horses allowed to feed in the same place, but without any shelter, soon succumbed to the disease. But, up to the present, the particular biting fly, mosquito, or other insect which was the carrier of this disease had not been discovered, and there can be no doubt that one of the most important facts to make out in the etiology of this disease was the discovery of the particular insect which conveyed the disease from the sick to the healthy. Prof. M'Fadyean also suggested that experiments were needed to show what is the "reservoir" of the virus. Although we had been unfortunate up to the present in not being able to make out the exact nature of the parasitic cause of this disease, a large amount of patient, persevering work had been done within the last ten years in regard to its prevention by protective inoculation. In this important work, Bordet, Edington, Koch, Theiler, Watkins-Pitchford, and others had laboured for many years, and, according to recent reports, with some measure of success. The man who discovered a practical method of dealing with horse-sickness would be one of the greatest benefactors of this country. There had always been a tradition that a large money reward was awaiting this discovery. He did not know whether this was well founded or not, but certainly such a work would well deserve the highest possible reward. The best reward was to give the successful investigator more opportunity and more assistance in pursuing his beneficent work. The reward given by the French people to Pasteur was the Pasteur Institute; by the German Government to Koch, the Imperial Hygienic Institution.

Catarrhal fever of sheep was first described by Hutcheon, the chief veterinary surgeon of Cape Colony, to whom South Africa owed its knowledge of many stock diseases. It was very similar in many respects to horse-sickness. Both these diseases occurred most often in low-lying, damp situations, such as river valleys and the coast plain. They also occurred at the same time of the year; that was from January to April. Blue tongue, like horse-sickness, was probably carried from the sick to the healthy by means of some night-feeding insect. To Mr. Spreull, Government Veterinary Surgeon in Cape Colony, acting under the advice of Hutcheon, was due the credit of proving that a preventive serum could be prepared capable of immunizing sheep against this disease. Heart-water of cattle, goats, and sheep was also first clearly described by Mr. Hutcheon. It occurred in the Transvaal, Natal, and Cape Colony, and was responsible for much of the yearly loss among the cattle, sheep, and goats. Like the last disease—blue tongue—it resembled horse-sickness in many ways, and, in fact, had been described by Dr. Edington as being identical with it. Heart-water had a peculiar distribution, being restricted to the certain tracts of country with a warm, moist climate. It was known to farmers that if they removed their flocks to the high veld the disease died out.—*The Times.*

DISEASES OF ANIMALS ACTS 1894 TO 1903. SUMMARY OF RETURNS.

Period.		Anthrax.		Foot-and-Mouth Disease.		Glanders (including Farcy)		Rabies. Cases Confirmed.		Sheep Scab.	Swine Fever.	
		Out-breaks	Ani-mals.	Out-breaks	Ani-mals.	Out-breaks	Ani-mals.	Dogs.	Other	Out-breaks	Out-breaks.	Slaughtered *
GT. BRITAIN. Week ended Sept. 2		18	19	..	..	30	59	..	..	6	12	77
Corresponding week in	1904 ..	7	9	..	..	42	66	..	..	3	26	55
	1903 ..	10	12	..	..	37	70	..	..	1	14	96
	1902 ..	11	18	..	..	24	56	..	..	5	13	45
Total for 35 weeks, 1905		665	933	..	..	857	1488	..	..	660	604	2749
Corresponding period in	1904 ..	666	1056	..	..	1072	1893	..	..	1068	996	4576
	1903 ..	545	832	..	..	1026	1683	..	..	1177	1109	5688
	1902 ..	476	768	1	120	784	1395	12	11	1122	1215	5500
Board of Agriculture and Fisheries, Sept. 5, 1905.												
IRELAND. Week ended Aug. 26		1	1	..	..	..	..	..	..	..	1	83
Corresponding Week in	1904 ..	..	..	..	..	..	..	..	..	3	13	96
	1903 ..	..	..	..	..	1	1	..	..	..	6	134
	1902 ..	..	..	..	..	1	1	..	..	..	10	97
Total for 33 weeks, 1905		3	3	..	..	13	35	..	..	228	39	1200
Corresponding period in	1904 ..	2	2	..	..	8	29	..	..	371	134	2889
	1903 ..	2	3	..	..	2	3	2	..	396	121	2741
	1902 ..	..	..	..	..	7	26	..	..	437	133	2669

Epizootic Lymphangitis, Jan. 2 cases; Feb. 2; Mar. 10: May, 1; June, 7: Week ending July 1st, 1; 8th, 1: Total 24

Department of Agriculture and Technical Instruction for Ireland, (Castle Street), Dublin, Aug. 31, 1905.

NOTE.—The figures for the Current Year are approximate only.

* As Diseased or Exposed to Infection.

GLANDERS IN MAN.

At the London Hospital Mr. Baxter held an inquest on Albert Edward Tharby, 21, of 71 Great Hermitage Street, Wapping. Deceased became ill on Aug. 6, and was admitted to the Hospital on the 14th. He died on Thursday, Aug. 30. A post-mortem examination proved without doubt that death was due to glanders.

Mr. Shaw, F.R.C.V.S., said he had carefully examined every horse in the stables of deceased's employer, and specially the one the deceased drove. Witness was perfectly satisfied that the stables were quite clear from glanders.

The jury returned a verdict of "Death by misadventure, the result of glanders, the origin of which the evidence fails to show."

We are indebted to Mr. Wm. Shaw, F.R.C.V.S., for the following notes on this case :—

Aug. 5. Man unwell.

7. Went to see Dr. Sargent, High Street, Shadwell, who treated him at his surgery daily, until 10th inst.

Aug. 13. Was worse, large red spot on each knee with pain at these joints. Doctor came to see him at his house. Said he was suffering from septic pneumonia and had better go in the hospital.

Aug. 14. Entered London Hospital.

Died on the night of Aug. 30.

From 5th, when man was unwell, until 14th his brother slept in the same bed with him.

Aug. 24, 4.30, I received a telegram from L.C.C. I went at 6.30. Saw the brother, who told me all he knew about the case. When talking at the door he said, "This is the mare my brother drove coming down the street." I examined her in the street, but found no symptoms. He had driven this horse for over three years, from Old Gravel Lane Yard, on a contract job.

Aug. 27. Examined all Mr. Santon's horses—74.

24 horses	Old Gravel Lane.	No glanders here for 13 months.
22 "	57 Great Hermitage Street.	
17 "	42 "	"
11 "	36 "	"

No horse found to present any symptom of Glanders.

As man was ill I asked to have bay mare he drove tested; it was done at once by Mr. Caton, V.S., in front of me in the yard.

Aug. 28. No reaction. Temp. normal.

This man Tharby did not clean or feed any other horse but his own mare which he drove.

The food is all cut and mixed for the carmen, and the horses are fed in before the horses return from work.

PROSECUTION BY THE R.C.V.S.

At the Congleton Borough Police Court, on Thursday, August 31st, before I. Salt in the chair, and W. L. Carson, Esqrs.

Frank Ball, of Dial Lane, Biddulph, and recently of Dane-in-Shaw, Congleton, was summoned for that he, not being on the Register of Veterinary Surgeons, and not holding at the time of the passing of the Veterinary Surgeons Act, 1881, the Veterinary Certificate of the Highland and Agricultural Society of Scotland, did on the 30th of January last, in the Borough of Congleton, unlawfully take or use the title of Veterinary Surgeon contrary to Section 17 of the aforesaid Statute.

The proceedings were taken at the instance of the Royal College of Veterinary Surgeons, Mr. E. A. Plant appearing for the prosecution, and Mr. Arthur Andrew (Messrs. Andrew and Horn) for the defence.

Mr. Plant, in opening the case, said that Section 17 of the Act, under which the proceedings were taken enacted that after December 17th, 1881; anyone not possessing the certificate of the Highland and Agricultural Society of Scotland who took the title of Veterinary Surgeon should be liable to a penalty not exceeding £5. The Statute also enacted that a Register of persons entitled to call themselves Veterinary Surgeons should be published annually, and that the production of a copy of such Register should be deemed sufficient evidence as to whether a person was so entitled or not. In the present case, Mr. George Bostock, a Biddulph farmer, had two horses injured last December, and hearing of Mr. Ball, Bostock sent for him, and at his request, without any inquiry as to whether he was a veterinary surgeon or not, defendant attended to and treated the horses until January, 29th, 1905. On January 30th Mr. Bostock received from the defendant a bill of which the heading was :—

January 30th, 1905.

Mr. George Bostock,
Dr. To F. Ball,
Veterinary Surgeon, Dane-in-Shaw."

Subsequently there was a County Court action in the Potteries, in which Bostock was the plaintiff, and Ball was one of the witnesses as to the injury to the horses, but whether as a veterinary surgeon or not he was unable to say. Still, he submitted that the bill alone was sufficient to warrant a conviction, and he put in the last published Register of Veterinary Surgeons, on which defendant's name did not appear.

Mr. George Bostock, farmer, Hay Hill Farm, Biddulph, deposed that in December last two of his horses were injured at Hanley by an electric tram. Having had serious losses before, and having heard of Mr. Ball, he went to see him. As the result defendant attended his horses for some time, and witness received a bill from him for £3 4s., the bill produced being similar to the one he received, but he could not tell if it was the same one, as he took an action against the Electric Traction Company and sent all the bills to his solicitor. In the bill produced the defendant described himself as a veterinary surgeon, though when he went for him he did not know whether he was a veterinary surgeon or not, and he did not ask him.

Cross-examined : He had the bill produced from Mr. Ball, it was delivered at his farm.

Mr. Andrew submitted that on that evidence the prosecution must fail, as the bill produced was published in Biddulph, and therefore outside the jurisdiction of the Bench.

The Magistrates' Clerk said he must advise the Bench that they had jurisdiction as the Bill must have been made at Dane-in-Shaw, where he resided.

Mr. Andrew replied that that was really a criminal prosecution, and nothing could be presumed, and therefore they must prove that the Bill was made out in Congleton.

In reply to Mr. Plant, Mr. Bostock said that when he first saw Mr. Ball he resided at the Cloud, Buglawton, but he resided at Dane-in-Shaw when he fetched him to the horses in December.

Cross-examination continued : Defendant never told him that he was a veterinary surgeon, and he (witness) only went to him because he heard that he was very clever in treating animals.

Mr. Andrews asked the Bench to take formal notice of his objection which the Clerk had over-ruled. The defendant formerly lived at Stockport where he was assistant to a well-known veterinary surgeon, and as such he attained some skill in the treatment of cattle. Owing to his health he came with his family to reside at the Cloud without any intention of practising as a veterinary surgeon, as he had some means. The people, however, found out that he was able to advise them in the treatment of cattle and their ailments, and consulted him about them, but he did not charge them for his advice.

In the case of Mr. Bostock he treated the horses and made out the bill produced entirely for the purposes of Mr. Bostock's action and this was the only occasion on which he had done so. Therefore, if the Bench decided to convict, he thought they would be justified in coming to the conclusion that a small penalty would meet the requirements of the case.

Defendant deposed that for several years he was an assistant to a veterinary surgeon at Stockport. Owing to his health he came to reside at the Cloud, and bit by bit people got him to treat their cattle, but he never charged any professional fees until the present case, when he made out the bill for the purposes of the action brought by Mr. Bostock. He had no sign or anything to show that he practised as a veterinary surgeon.

Cross-examined by Mr. Plant, defendant admitted that at the hearing at Hanley he gave evidence and described himself as a veterinary surgeon.

The Chairman said the Bench considered the case proved, and defendant would be fined 30s. including costs.—*Congleton Chronicle.*

Meat Famine in Germany.

The Berlin correspondent of *The Daily Telegraph* writes:—"The scarcity of meat, especially of pork, throughout Germany begins to assume such importance that some measures to relieve it are imperatively called for from the Government. From all sides, except from the agricultural section of the population, the Government is asked to permit the free import of Russian pigs across the frontier, at any rate until the crisis is past. But neither Prince Bülow nor General Pedbielski, the Minister of Agriculture, seem inclined to take this advice, especially as its acceptance would give offence to their agrarian friends. Petitions from industrial regions keep pouring in, praying the Government to take steps to mitigate the distress caused by the high prices of pork, but nothing has yet been done, except that orders have been given to collect particulars as to how far actual distress exists, and in what areas. The consumption of horse-flesh is increasing, and in Erfurt a restaurant has been opened with exclusively horse-flesh dishes."

ARMY VETERINARY DEPARTMENT.

Extract from *London Gazette.*

WAR OFFICE, PALL MALL, Sept. 5.

The undermentioned officers are granted temporary rank in the Army while serving in South Africa, as follows:—

The 1st Victorian Contingent.—To be Vet.-Capt.: Vet.-Capt. Ernest Arthur Kendall, Vet. Officer. Dated 27th November, 1899.

The 2nd Contingent (Victorian Mounted Rifles).—To be Vet.-Capt.: Vet.-Capt. Harold Sugden Ruddock. Dated 6th February, 1900.

The 3rd Victorian (or Bushman's) Contingent.—To be Vet.-Lieut.: Vet.-Lieut. Stanley Fletcher, Veterinary Officer. Dated 12th April, 1900.

The 5th Contingent (Victorian Mounted Rifles).—To be Vet.-Capt.: Vet.-Capt. Samuel Sherlock, Veterinary Officer. Dated 18th January, 1901.

To be Vet.-Lieut.: Vet.-Lieut. Charles Denniston Strong, Veterinary Officer. Dated 26th January, 1901.

The 2nd Queensland Mounted Infantry.—To be Vet.-Capt.: Vet.-Capt. Alfred William Barnes, Veterinary Officer.

The 5th Queensland Imperial Bushmen.—To be Vet.-Lieut.: Vet.-Lieut. George Tucker, Veterinary Officer. Dated 4th March, 1901.

CORRESPONDENCE.

THE ULTRA-POISONOUS DOSES OF MEDICAMENTS ON DOGS, ETC.

Sir,

It is almost a general law in therapy that small and too frequently repeated doses of medicinal agents have a much more potent effect than very large doses, especially on those animals, such as the rat, cat, and dog, that can easily reject them by emesis.

I have just had an example of the non-toxic or rather non-lethal dose of Biniodide of mercury ointment in the dog.

The other day I went to a farmer's place to blister a horse; my man put down a jar containing about six ounces of Biniodide of mercury ointment (1 in 8). This farmer walks a couple of fox-hounds every year. One of the hounds swallowed about three ounces of this ointment. As soon as we could catch him I gave the ordinary common or garden domestic emetic, which had the desired effect. I afterwards bundled my man off with a prescription for an antidote, but the hound was no worse for his meal, much to the relief of the farmer who was stamping, and swearing, and valuing the animal at abnormal sums, and bemoaning his fate that he would be done out of the Cup this year for the best couple of hounds walked. I added fuel to the fire by telling him he could not feed the hounds very well or they would not eat ointment so ravenously. The farmer's attitude and language would have made fine copy for a "Comic" if by chance an artist had been present.

A. P. BURGON, M.R.C.V.S.

THE LATE MR. WEST, M.R.C.V.S.

Sir,

May I, as the original maker of "West's Clamp," add to the testimony of the purely unselfish character of the inventor alluded to by Mr. Leeney in your last issue?

Having received the original pattern from this gentlemen, and recognising its value, I took it to Mr. West, who was an old friend and valued client, I suggested patenting the instrument and pay him a Royalty on all sold, but he said, "No, don't patent it," and "I don't want anything out of it; introduce it to the profession as reasonably as you can; I know from experience it will be found a useful instrument, and I shall be quite satisfied to know that my efforts as an inventor may be appreciated by my brother veterinary surgeons. You can much improve it, as mine are made roughly by a blacksmith who simply saws them out of a piece of coach spring, and files up the teeth; hammers out a rivet to make a hinge, fits a thumbscrew, and that does for me."

The result of this conversation is the finely finished instrument of to-day, hundreds of which have been supplied by us to the profession, and are much appreciated all over the civilised world.—Yours faithfully,

C. H. HUISH.

Red Lion Square, W.C.

CATTLE TUBERCULOSIS. A Practical Guide to the Agriculturist and Inspector, by HAROLD SESSIONS, F.R.C.V.S., F.H.A.S., F.R.G.S.: second edition. Cr. 8vo., cloth lettered. vi. + 120 pp. No advertisements. 3/- net. Ballière, Tindall & Cox, 8 Henrietta Street, Strand, W.C.

COMMUNICATIONS AND PAPERS RECEIVED.—Messrs. H. Leeney, G. Mayall. The Granville Press. *The Evening News.* [Sep. 2

Messrs. J. E. Miller, R. Rutherford, H. Gray, J. Toms, R. Watson, G. Thatcher. Prof. Axe.

The Canterbury Times (N.Z.) *The Western Evening Herald.* [Sept. 9.

Journal of the Sanitary Institute.

We shall be obliged by early intelligence of all matters worth bringing under the notice of the profession, and thankful to any friends who may send us cuttings from local papers containing facts of interest.